CLAIMS

What is claimed is:

1.   A method for allocating a logical volume to a physical volume, said method comprising:

interrogating a logical partition of a sparse logical volume to determine if said logical partition contains valid data;

in response to a determination that said logical partition contains valid data, allocating said logical partition to a corresponding physical partition within a physical volume; and

in response to a determination that said logical partition does not contain any valid data, returning to said interrogating for a next logical partition within said sparse logical volume.

1   2.   The method of Claim 1, wherein said method further includes recording the
2   relationship between partitions within said sparse logical volume and partitions within said
3   physical volume in a mapping list.

1   3.   The method of Claim 1, wherein said method further includes recording the
2   relationship between partitions within said sparse logical volume and partitions within said
3   physical volume in an extent list.

1 4.   A method for synchronizing a sparse logical volume within a mirrored physical

2 volume configuration after one of said mirrored physical volumes has been damaged, said

3 method comprising:

4   replacing said damaged physical volume with a replacement physical

5   volume;

6   interrogating a partition within said sparse logical volume;

7   in response to said partition within said sparse logical volume being

8   allocated, copying said partition to said replacement physical volume and returning

9   to said interrogating until all partitions within said sparse logical volume have been

10   interrogated; and

11   in response to said partition within said sparse logical volume not being

12   allocated, returning to said interrogating until all partitions within said sparse logical

13   volume have been interrogated.

1   5.   The method of Claim 4, wherein said method further includes allocating only in-use

2   partitions of said sparse logical volume in said mirrored physical volumes.

1   6.   The method of Claim 4, wherein said method further includes recording the

2   relationship between partitions within said sparse logical volume and partitions within said

3   mirrored physical volumes in a mapping list.

1   7.   The method of Claim 4, wherein said method further includes recording the

2   relationship between partitions within said sparse logical volume and partitions within said

3   mirrored physical volumes in an extent list.

8.   A computer program product residing on a computer usable medium for synchronizing a sparse logical volume within a mirrored physical volume configuration after one of said mirrored physical volumes has been damaged, said computer program product comprising:

program code means for replacing said damaged physical volume with a replacement physical volume;

program code means for interrogating a partition within said sparse logical volume;

in response to said partition within said sparse logical volume being allocated, program code means for copying said partition to said replacement physical volume and returning to said interrogating until all partitions within said sparse logical volume have been interrogated; and

in response to said partition within said sparse logical volume not being allocated, program code means for returning to said interrogating until all partitions within said sparse logical volume have been interrogated.

1   9.   The computer program product of Claim 8, wherein said computer program product

2   further includes program code means for allocating only in-use partitions of said sparse

3   logical volume in said mirrored physical volumes.

1   10.   The computer program product of Claim 8, wherein said computer program product

2   further includes program code means for recording the relationship between partitions

3   within said sparse logical volume and partitions within said mirrored physical volumes in

4   a mapping list.

1   11.   The computer program product of Claim 8, wherein said computer program product

2   further includes program code means for recording the relationship between partitions

3   within said sparse logical volume and partitions within said mirrored physical volumes in

4   an extent list.

1   12.   An apparatus for synchronizing a sparse logical volume within a mirrored physical

2   volume configuration after one of said mirrored physical volumes has been damaged, said

3   apparatus comprising:

4   means for replacing said damaged physical volume with a replacement

5   physical volume;

6   means for interrogating a partition within said sparse logical volume;

7   in response to said partition within said sparse logical volume being

8   allocated, means for copying said partition to said replacement physical volume and

9   returning to said interrogating until all partitions within said sparse logical volume

10   have been interrogated; and

11   in response to said partition within said sparse logical volume not being

12   allocated, means for returning to said interrogating until all partitions within said

13   sparse logical volume have been interrogated.

1 13. The apparatus of Claim 12, wherein said apparatus further includes means for
2 allocating only in-use partitions of said sparse logical volume in said mirrored physical
3 volumes.

1 14. The apparatus of Claim 12, wherein said apparatus further includes means for
2 recording the relationship between partitions within said sparse logical volume and
3 partitions within said mirrored physical volumes in a mapping list.

1 15. The apparatus of Claim 12, wherein said apparatus further includes means for
2 recording the relationship between partitions within said sparse logical volume and
3 partitions within said mirrored physical volumes in an extent list.